PennState Extension

Stone Fruit Disease - Black Knot

Black knot of plum, caused by the fungus Dibotryon morbosum, is well-named because of the characteristic black, warty knots it forms on branches of infected trees.

Updated: June 19, 2024

Photo by G. Moorman

Such trees grow poorly and gradually become stunted; occasionally, their limbs may be girdled. The disease is most important on plum trees and, secondarily, on cherry trees.

Symptoms

The disease is present only in the woody parts of trees, occurring most frequently on twigs and branches and sometimes on trunks and scaffold limbs. The warty swellings first become visible in late summer or the following spring on new shoots. At first the knots are somewhat olive greenish and corky, but with age they become black and hard. They vary in length from an inch to nearly a foot. Many times they do not completely circle the branch. Those a year old or older may become covered with the pinkish white mold of another fungus and may become riddled with insects, especially lesser peach borers. Numerous infections may cause general decline in growth and lead to loss of branches and tree death in a few years.

Disease cycle

The fungus overwinters in the knots. About the time new seasonal growth is ½ inch long, ascospores of the fungus are discharged from tiny sacs in the surface of the knots. These are spread by rain and wind to the new growth, where infection takes place. Spore discharge and infection are greatest during wet periods, at temperatures ranging from 55 to 75°F. Infections continue to occur until terminal growth stops. A few greenish, corky swellings may become visible the fall after infection occurs, but most will not be noticed until the following spring. Generally, the knots produce no spores until the second spring after they become visible. The fungus in woody tissues continues to grow in the spring and fall, increasing the knots' length. Their eventual size depends greatly on the host species and cultivar.

Disease management

Plum cultivars resistant to black knot should be selected where possible. Plum varieties with some resistance include President, Bluebyrd, Methley, Milton, Early Italian, Fellenberg, Shiro, Santa Rosa, Shiro, Castleton, Seneca, Damson, Bluefree, NY9, Formosa, and Au Rosa. Stanley, Valor, Rosy Gage, and Shropshire are varieties considered very susceptible. New plantings of plums should not be made next to old ones with black knot. Remove any wild plum and cherry trees from nearby woods and fencerows for at least 500 feet from the new orchard. Once the disease appears in the trees, remove the knots. When they occur on twigs and small branches, prune out the infected branches about 4 inches below the knot. On large branches and trunks, the knots can be cut out. This is done most successfully during August when the fungus does not extend far beyond the visible swelling. Be sure to remove any infected branches in the winter if black knot returns after August. Remove the diseased wood and about 1 inch of clean wood around the knot. It is best to remove knots before growth begins in the spring and to take them away from the orchard, as they will continue to produce spores for several weeks after removal. Be sure to destroy infected tissue to limit the spread of spores. Once the knots have been removed, fungicide sprays can be applied to control the disease. Sprays must be applied in early spring to protect young green shoots. Begin fungicide treatment when flower buds are just beginning to open. Repeat sprays according to label instructions (typically every 7-10 days) until shoots mature or the weather is consistently warm and dry. Sprays are most effective when applied before a rain event when temperatures are warmer than 60°F. When spore levels are high because of an established black knot problem or a neighboring abandoned orchard, protection may be needed from bud break until early summer. The most effective fungicides include captan, chlorothalonil, fenbuconazole, propiconazole thiabendazole, and wettable sulfur. Iprodione, myclobutanil, and tebuconazole are ineffective.

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Expertise

- Apple and pear diseases
- Peach, cherry, other stone fruit diseases
- Tree fruit disease management